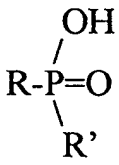
WHAT IS CLAIMED IS:

1. A pellet composition comprising PHA, wherein the PHA has a molecular weight greater than about 470,000.

2. The pellet composition of claim 1, further comprising a thermal stabilizer in an amount sufficient to inhibit PHA degradation, wherein the Mw of the PHA in said pellet is greater than about 435,000.

3. The pellet composition of claim 2, wherein the thermal stabilizer comprises a compound having the following structural formula:



where R' is R or OH, and R is a branched or unbranched saturated C_1-C_{30} group, a branched or unbranched unsaturated C_2-C_{30} group, a C_6-C_{30} aromatic group, or a saturated or unsaturated C_6-C_{30} cycloaliphatic group.

4. The pellet composition of claim 3, wherein the thermal stabilizer further contains one or more O, N, or S atoms in the alkyl chains

5. The pellet composition of claim 3, wherein the thermal stabilizer is substituted with one or more hydroxyl, halo, carboxylic acid or ester, cyano, aryl, amino, hydroxylamino, mono-, di-, or trialkyl amino, or phosphonic acid groups.

6. The pellet composition of claim 2, wherein the thermal stabilizer is cyclohexylphosphonic acid, 1-cyclohexenylphosphonic acid, 1-

hydroxycyclohexenylphosphonic acid, 1-hexanephosphonic acid, 1-hydroxyethylidene-1,1-diphosphonic acid, or dicyclohexylphosponic acid, 2,4,4-(trimethylpentyl)cyclohexylphosphonic acid.

7. The pellet composition of claim 2, wherein the thermal stabilizer comprises an oxide, hydroxide, or carboxylic acid salt of a metal from Groups I to V of the Periodic Table.

8. The pellet composition of claim 2, wherein the thermal stabilizer is calcium stearate, magnesium stearate, zinc stearate, or zinc oxide.

9. The pellet composition of claim 1, further comprising a nucleant.

10. The pellet composition of claim 9, wherein the nucleant comprises an organophosphorous compound having at least two phosphonic acid moieties.

11. The pellet composition of claim 10 wherein the organophosphorous compound is 1-hydroxyethylidene-1,1-diphosphonic acid.

12. The pellet composition of claim 10, wherein the nucleant further comprises a fatty acid salt of a metal from Group I to V of the Periodic Table.

13. The pellet composition of claim 10, wherein the nucleant further comprises a weak organic base selected from fatty acid amides.

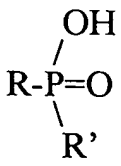
14. A method of using the PHA pellet composition of any one of claims 1- 13 to produce a PHA film comprising the steps of melting the PHA pellets and forming the melt into a film.

15. A method of using the PHA pellets of any one of claims 1-13 to produce a PHA product by extrusion, molding, coating, spinning or calendaring operations.

16. A method of making a pellet composition comprising the steps of melting PHA powder having a Mw greater than about 500,000, extruding a strand of the melted PHA, cooling and crystallizing the extruded strand and cutting the strand into pellets, wherein the PHA in the pellets has a Mw greater than about 470,000.

17. The method of claim 16, wherein the PHA in the powder has a Mw greater than about 480,000 and PHA in the pellet has a Mw greater than about 435,000, and wherein the PHA powder is melted in the presence of a thermal stabilizer

18. The method of claim 17, wherein the thermal stabilizer comprises a compound having the following structural formula:



where R' is R or OH, and R is a branched or unbranched saturated C_1-C_{30} group, a branched or unbranched unsaturated C_2-C_{30} group, a C_6-C_{30} aromatic group, or a saturated or unsaturated C_6-C_{30} cycloaliphatic group.

19. The method of claim 18, wherein the thermal stabilizer further contains one or more O, N, or S atoms in the alkyl chains.

20. The method of claim 18, wherein the thermal stabilizer is substituted with one or more hydroxyl, halo, carboxylic acid or ester, cyano, aryl, amino, hydroxylamino, mono-, di-, or trialkyl amino, or phosphonic acid groups.

21. The method of claim 17, wherein the thermal stabilizer is cyclohexylphosphonic acid, 1-cyclohexenylphosphonic acid, 1-hydroxycyclohexenylphosphonic acid, 1-hexanephosphonic acid, 1-hydroxyethylidene 1,1-diphosphonic acid, or dicyclohexylphosponic acid, 2,4,4-(trimethylpentyl) cyclohexylphosphonic acid.

22. The method of claim 17, wherein the thermal stabilizer comprises an oxide, hydroxide, or carboxylic acid salt of a metal from Groups I to V of the Periodic Table.

23. The method of claim 17, wherein the thermal stabilizer is calcium stearate, magnesium stearate, zinc stearate, or zinc oxide.

24. The method of claim 16, wherein the pellets further comprise a nucleant.

25. The method of claim 24, wherein the nucleant is an organophosphorous compound having at least two acid moieties.

26. The method of claim 25, wherein the organophosphorous compound is 1-hydroxyethylidene-1,1-diphosphonic acid.

27. The method of claim 25 wherein the nucleant further comprises a fatty acid salt of a metal from Group I to V of the Periodic Table.

28. The method of claim 25 wherein the nucleant further comprises a weak organic base selected from fatty acid amides.

29. A pellet composition produced according to any one of claims 16-28.

30. A blown or cast free-standing film comprising PHA, wherein the PHA has a molecular weight greater than about 420,000.

31. The film of claim 30, wherein the film is a blown film.

32. The film of claim 31, wherein the draw ratio of the blown film is between about 2 and 7.

33. The film of claim 31, wherein the film has a percent elongation at break greater than 65%.

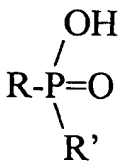
34. The film of claim 31, wherein the film has a percent elongation at break greater than 75%

35. The film of claim 31, wherein the film has a tensile strength at break greater than 50 Mpa.

36. The film of claim 31, wherein the tensile strength at break is greater than 75 Mpa.

37. The film of claim 30, further comprising a thermal stabilizer.

38. The film of claim 37, wherein the thermal stabilizer comprises a compound having the following structural formula:



where R' is R or OH, and R is a branched or unbranched saturated C_1-C_{30} group, a branched or unbranched unsaturated C_2-C_{30} group, a C_6-C_{30} aromatic group, or a saturated or unsaturated C_6-C_{30} cycloaliphatic group.

39. The film of claim 38, wherein the thermal stabilizer further contains one or more O, N, or S atoms in the alkyl chains

40. The film of claim 38, wherein the thermal stabilizer is substituted with one or more hydroxyl, halo, carboxylic acid or ester, cyano, aryl, amino, hydroxylamino, mono-, di-, or trialkyl amino, or phosphonic acid groups.

41. The film of claim 37, wherein the thermal stabilizer is cyclohexylphosphonic acid, 1-cyclohexenylphosphonic acid, 1-hydroxycyclohexenylphosphonic acid, 1-hexanephosphonic acid, 1-hydroxyethylidene-1,1-diphosphonic acid, or dicyclohexylphosponic acid, 2,4,4-(trimethylpentyl)cyclohexylphosphonic acid.

42. The film of claim 37, wherein the thermal stabilizer comprises an oxide, hydroxide, or carboxylic acid salt of a metal from Groups I to V of the Periodic Table.

43. The film of claim 37, wherein the thermal stabilizer is calcium stearate, magnesium stearate, zinc stearate, or zinc oxide.

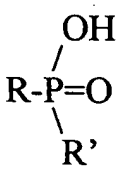
44. A method of producing a blown or cast free-standing film, comprising the steps of melting pellets comprising PHA wherein the PHA is said pellets has a Mw greater than about 470,000 and forming the melt into a film, wherein the Mw of the PHA in the film is greater than about 420,000.

45. The method of claim 44, wherein the film is produced by a continuous process.

46. The method of claim 44, wherein the melt is formed into a film by film blowing.

47. The method of claim 44, wherein the PHA is melted in the presence of a thermal stabilizer and wherein the PHA in said pellets has a Mw greater than about 435,000.

48. The method of claim 47, wherein the thermal stabilizer comprises a compound having the following structural formula:



where R' is R or OH, and R is a branched or unbranched saturated C_1-C_{30} group, a branched or unbranched unsaturated C_2-C_{30} group, a C_6-C_{30} aromatic group, or a saturated or unsaturated C_6-C_{30} cycloaliphatic group.

49. The method of claim 48, wherein the thermal stabilizer further contains one or more O, N, or S atoms in the alkyl chains

50. The method of claim 48, wherein the thermal stabilizer is substituted with one or more hydroxyl, halo, carboxylic acid or ester, cyano, aryl, amino, hydroxylamino, mono-, di-, or trialkyl amino, or phosphonic acid groups.

51. The method of claim 47, wherein the thermal stabilizer is cyclohexylphosphonic acid, 1-cyclohexenylphosphonic acid, 1-hydroxycyclohexenylphosphonic acid, 1-hexanephosphonic acid, 1-hydroxyethylidene-1,1-diphosphonic acid, or dicyclohexylphosponic acid, 2,4,4-(trimethylpentyl)cyclohexylphosphonic acid.

52. The method of claim 47, wherein the PHA thermal stabilizer comprises an oxide, hydroxide, or carboxylic acid salt of a metal from Groups I to V of the Periodic Table.

53. The method of claim 47, wherein the thermal stabilizer is calcium stearate, magnesium stearate, zinc stearate, or zinc oxide.

54. The method of claim 44, wherein the PHA pellets further comprise or are melted in the presence of a nucleant.

55. The method of claim 54, wherein the nucleant is an organophosphorous compound having at least two acid moieties.

56. The method of claim 55, wherein the organophosphorous compound is hydroxy-ethylidene-1,1-diphosphonic acid.

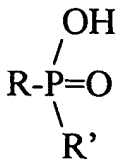
57. The method of claim 55 wherein the nucleant further comprises a fatty acid salt of a metal from Group I to V of the Periodic Table.

58. The method of claim 55 wherein the nucleant further comprises a weak organic base selected from fatty acid amides.

59. A blown or cast free-standing film produced according to any one of claims 44-58.

60. A method of inhibiting the thermal degradation of PHA comprising the steps of combining PHA with a thermal stabilizer selected from:

a. an organophosphorous compound having the following structural formula:



where R' is R or OH, and R is a branched or unbranched saturated C_1-C_{30} group, a branched or unbranched unsaturated C_2-C_{30} group, a C_6-C_{30} aromatic group, or a saturated or unsaturated C_6-C_{30} cycloaliphatic groups; and

b. an oxide, hydroxide, or carboxylic acid salt of a metal from Groups I to V of the Periodic Table; or mixtures thereof.

61. The method of claim 60 wherein the organophosphorous compound further contains one or more O, N, or S atoms in the alkyl chains

62. The method of claim 60, wherein the organophosphorous compound is substituted with one or more hydroxyl, halo, carboxylic acid or ester, cyano, aryl, amino, hydroxylamino, mono-, di-, or trialkyl amino, or phosphonic acid groups.

63. The method of claim 60, wherein the organophosphorous compound is cyclohexylphosphonic acid, 1-cyclohexenylphosphonic acid, 1-hydroxycyclohexenylphosphonic acid, 1-hexanephosphonic acid, 1-hydroxyethylidene-1,1-diphosphonic acid, or dicyclohexylphosponic acid, 2,4,4-(trimethylpentyl)cyclohexylphosphonic acid.

64. The method of claim 60, wherein the thermal stabilizer is calcium stearate, magnesium stearate, zinc stearate, or zinc oxide.

65. The method of claim 60, wherein the thermal stabilizer comprises cyclohexyl phosphonic acid and zinc stearate.